International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 09 Issue: 01 | Jan - 2025 SJIF Rating: 8.448 ISSN: 2582-3930

"Identification of Birds by Using Merlin App in & Around Siddipet"

Saba Tabassum[1], G. Venkatesh[2], Dr. P. Ayodhya Reddy[3], Dr.T. Jagadeeshwara chari[4],

[1]M. Sc Zoology Student, [2]Lec.in Zoology, [3]Assoc.Prof of Zoology, [4]Lec.in Fisheries

Government Degree & PG College (Autonomous), Siddipet, Aff.to Osmania University

ABSTRACT

Identification of bird's species plays an important role in biodiversity conservation. The Merlin Bird app developed by Cornel lab. The app leverages vast data base, including images, audio etc, to identify birds based on users submitted photos, sound recordings, or particular inputs such as location, size and colour. This paper highlights how Merlin's app identifies the birds. The app's innovative integration of technology with ornithology showcases the potential of AI in advancing ecological studies and fostering a deeper connection between humans and nature. This helps to identify the bird's species at a particular area.

KEY WORDS

Merlin app, Biodiversity, Bird Species, Ecological studies, Species richness

INTRODUCTION

Merlin app is developed by the Cornell lab of ornithology, it is designed to identification of bird species. Merlin utilizes a sophisticated app. Opening the app are promoted to input their location, through GPS which use to get the list of possible bird species based on the region`s avian fauna.

These identification process, as birds can vary greatly in appearance & distribution across different regions. By providing detailed information about bird's attributes. We can narrow the list of potential matches to arrive more accurate identification. Identification process includes detailed description, range maps, and audio recordings of birds call and songs. Presenting with a wealth of information about each species, Merlin empowers them to make informed decisions & confidently identify the birds in the field. Merlin serves as a valuable tool for all of us. Enabling us to enhance birding experience & deepen the understanding of the natural world. Its intuitive interface, comprehensive database, & advanced identification algorithms make it an indispensable companion for anyone including us with an interest in birds. Whether casual observer or dedicated ornithologist, merlin provides a powerful platform for exploring & connecting with the avian diversity that surrounds us.

Birds are a fascinating group of animals that come in a wide range of size colors and behaviors.

Birds are characterized by features like feathers, beak and the ability to fly. (though not all birds can fly) birds are found throughout the world, at approximately all altitudes and in nearly every climate. Birds are often

common denizens of the ecosystem. (1) ***P Pavani et al 2024*** stated that 12 bird's species are available at komati cheruvu. There are two types Birds of Terrestrial- there are bird living on the site land. Ex. grouse, cartridges, turkeys, pheasants, roadrunners. Aquatic- there are bird living in the water. Ex- goose, penguin, loon, gulls, duck. They eat both plants and animals from air, water or land. Birds have no teeth- moves into two chambered stomach most birds build nest. A lot of birds begin nesting with complicated rituals courtship, Bird special organs air sacs in addition to lungs. Study of avian diversity is an essential ecological tool which acts as an important indicator to evaluate different habitats both qualitatively and quantitatively, which has received almost no scientific attention. Birds are sensitive to habitat change and are easy to census, birds are an important tool for ecologists measuring the health of environments. Whether ecosystems are managed for agricultural production, wildlife, water, or tourism, success can be measured by the health and diversity of bird populations. Birds help maintain sustainable population levels of their prey and predator species and, after death, provide food for scavengers and decomposers. Many birds are important in plant reproduction through their services as pollinators or seed dispersers.

MATERIALS & METHODS

Mobile phone, Merlin bird app, Camera, binoculars**.**

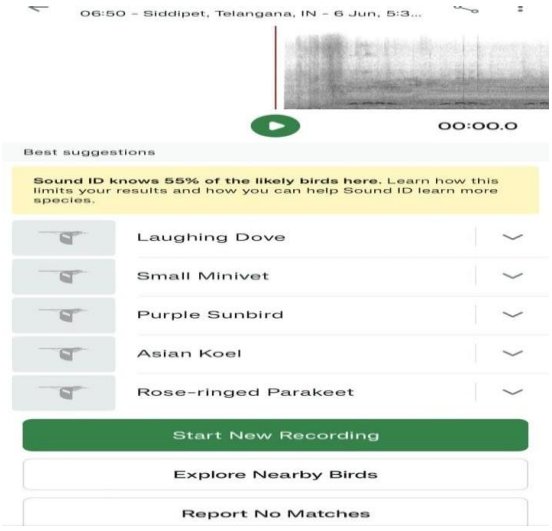
METHODS

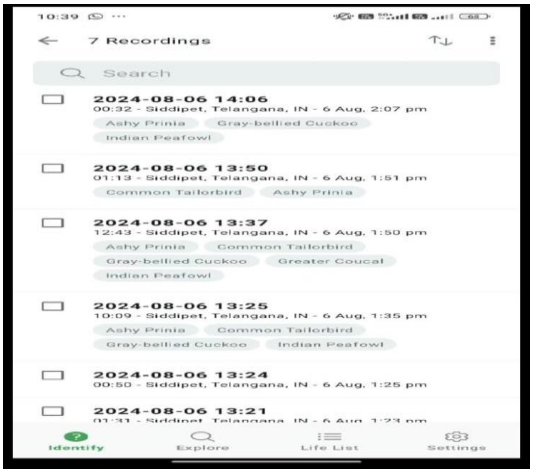
- Identify the various birds in & around siddipet.
- The methadology involved walking trails in the morning from 7:00-9:00 and in the evening from 5:00- 6:30. The uncommon birds in this area were photographed using a camera.
- Surveys were conducted in totally 4 places in siddipet. The visited at government degree college, Komati chervu, narsapur chervu, erra chervu which are located at siddipet district.
- Downloaded the merlin app.
- Press on the sounds recording of birds.
- Then Merlin app will automatically record the sounds of birds which are nearby us.
- And Merlin app will give the birds name which are recorded sounds of birds on the display if we want it will give the information of the birds.
- Finally, at this location we the team members are found these birds.

➢ We took the screen shots and photos of these birds those are here with the location by the use of MERLIN APP.

Fig.Siddipet map

RECORDED BIRDS BY MERLIN APP





❖ The work was carried out during June-2024 to august-2024 for three months at siddipet in Telangana, India.

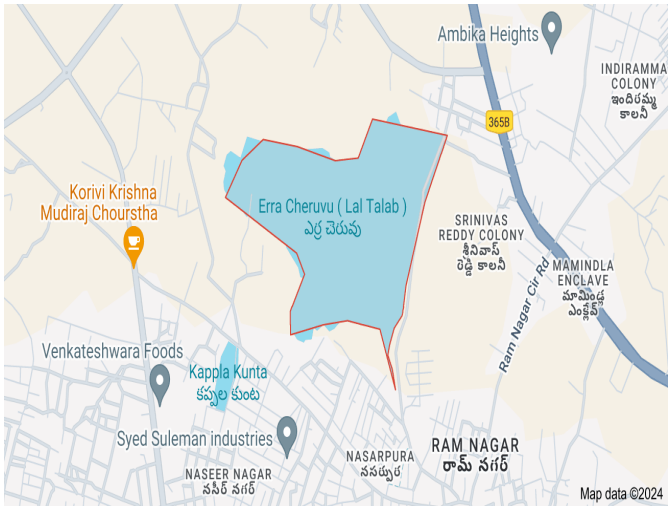
❖ The four different places were selected to record the data as site-1 ERRA CHERUVU site- 2 government degree college surrounding site-3 NARSAPUR CHERUVU site-4 KOMATI CHERUVU at siddipet district.

❖ Data collection by slighting and total count method using merlin app including visible flying individuals and through sounds and photographs.

❖ Data records were obtained thrice in a month or weak.

PLACE 1: IDENTIFIED BIRDS AT ERRA CHERUVU BY USING MERLIN APP:

BIRD NAME	SCIENTIFIC NAME	HABITAT	CHARACTERISTICS
White-throated kingfisher	*Halcyon smyrnensis*	Mostly open areas, with trees, wires or other perches.	The adult has a bright blue back, wings and tails.
Purple sunbird	*Cinnyris asiaticus*	They are found in thin forest and green land, including those in dense urban areas.	Species is primarily olive-brown with blackish upperparts and yellow under part.
Asian koel	*Eudynamys scolopaceus*	The Asian koel is a bird of light woodland and cultivation.	A large member of the cuckoo family and like many of its related cuckoo.
Yellow-billed babbler	*Turdoides affinis*	Scrub, cultivation and garden land.	Bird is a medium-sized, noisy bird.
Baya bird	*Ploceus philippinus*	Grasslands, cultivated areas, scrub	Complex flight patterns, social &gregarious birds.
Small mini vet	*Pericrocotus cinnamomeus*	Thorny jungles, scrub patches & open dry forest.	16cm long with a strong dark beak and long wings.
Indian peafowl	*Pavo cristatus*	Desert, agriculture filed, forest, park	Elongated upper tail feathers, flashy plunge, blue head, neck.
Spoted dove	*Spilopelia chinensis*	Woodland, scrub	A medium size,colour is brown.



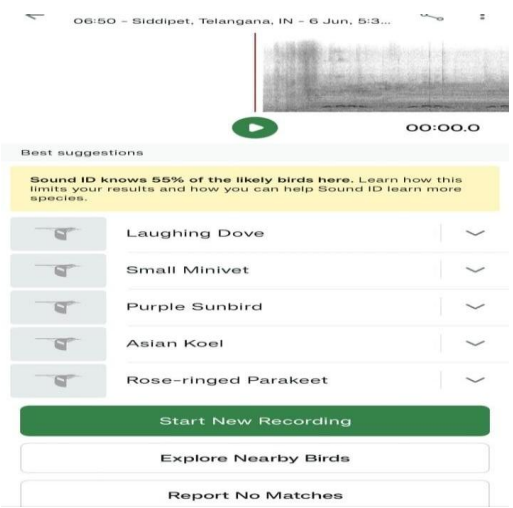


Fig Erra cheruvu

PLACE 2: IDENTIFIED BIRDS IN GOVT DEGREE COLLEGE(A) SIDDIPET BY USING MERLIN APP:

BIRD NAME	SCIENTIFIC NAME	HABITAT	CHARACTERISTICS
1. Red vented bulbul	*Pycnonotus cafer*	Dry scrub, open forest.	Identified by its Short crest giving the head a squarish appearance.
2. House sparrow	*Passer domesticus*	Close to human habitations.	Its is a small brown-colored bird tennis ball, with black streak its back.
3. Common myna	*Acridotheres tristis*	Open woodland, cultivation &around habitation.	Brown with a black head.it has a yellow bill, leg & bare eye skin.
4. White naped woodpecker	*Chrysocolaptes festivus*	Open wooded habitat	Is is a typical woodpecker shape. The white hind neck extends down the back.
5. Ashy prinia	*Prinia socialis*	Dry open grass land, woodland, garden	Black bill, pale cinnamon under parts, a grey head, a gray- brown back.
6. Common king fisher	*Alcedo atthis*	Along trees, lakes	Short-tailed, large-headed kingfisher profile.
7. Crow	*Corvus*	Woodlands, farmlands, Neighborhoods.	Intelligent, inquisitive & sometimes mischievous birds.
8. Purple rumped sunbird	*Leptocoma zeylonica*	Trees, including scrub & cultivation	Tiny, at less than 10 centimeters (4 in) long.

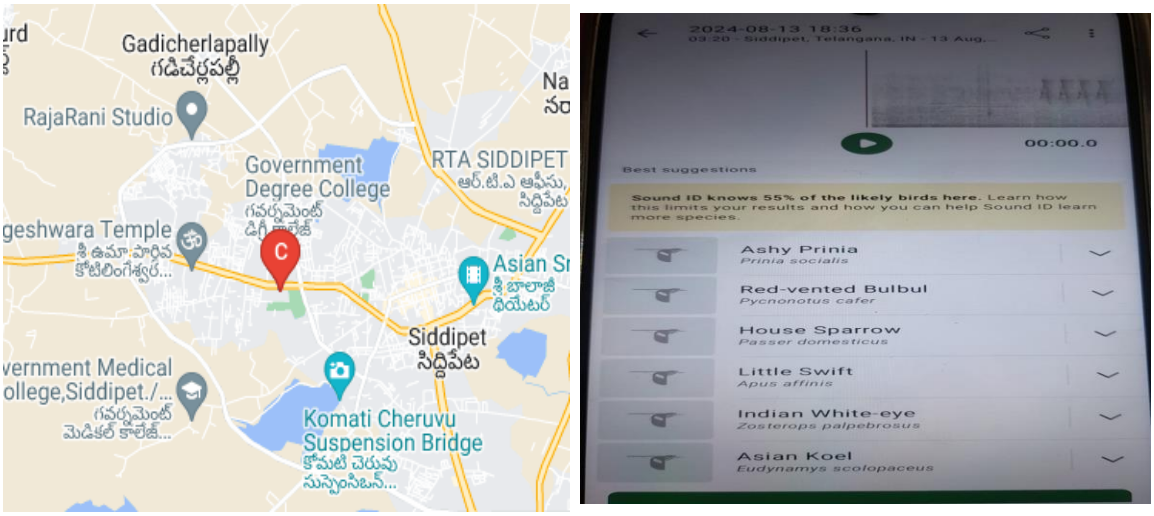


Fig. Government Degree College (A), Siddipet, Telangana

PLACE 3: IDENTIFIED BIRDS AT KOMATI CHERUVU BY USING MERLIN APP

BIRD NAME	SCIENTIFIC NAME	HABITAT	CHARACTERISTICS
1. Laughing dove	*Spilopelia senegalensis*	Dry scrub and semi-desert habitats	Long- tailed, slim pigeon, typically 25 cm (9.8) in length.
2. Greater coucal	*Centropus sinensis*	Mangroves, shrublands, grass land.	Large, crow-like with a long tail and copper brown wings.
3. Common hawk cuckoo	*Hierococcyx varius*	Garden land, grooves of tree, deciduous.	Dove-sized bird with a blue-grey back, head & chest.
4. Green sandpiper	*Tringa ochropus*	Clearing and marshes in woodland	Colour in blackish-green, size about 22cmlong, medium length.
5. Indian pond heron	*Ardeola*	Marshy wetland	Adults in breeding plumage have a dark reddish-brown back that yellowish head.
6. Common tailor bird	*Orthotomus sutorius*	Open woodland, scrub and garden	Brightly colored bird, with bright green upper part &creamy underparts.
7. Red rumped swallow	*Cecropis daurica*	Populations are migratory	Dark, glossy-blue backs, red throats, long tail.
8. Rose-ring parakeet	*Psittacula krameri*	Grasslands, shrublands	A strong curved bill, an upright stance, strong legs.

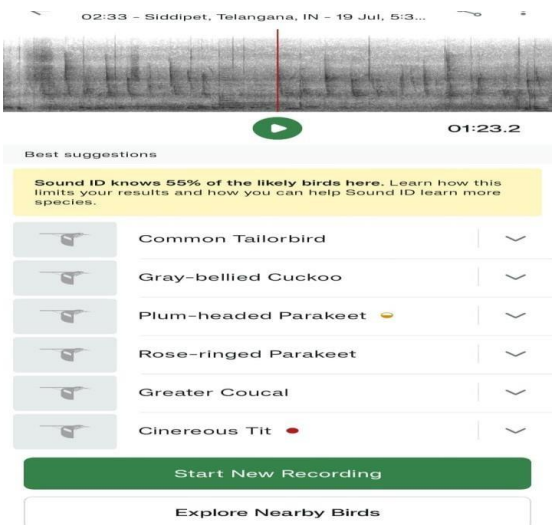
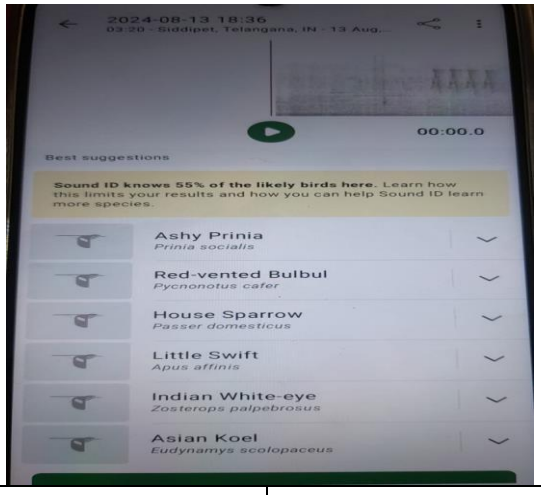


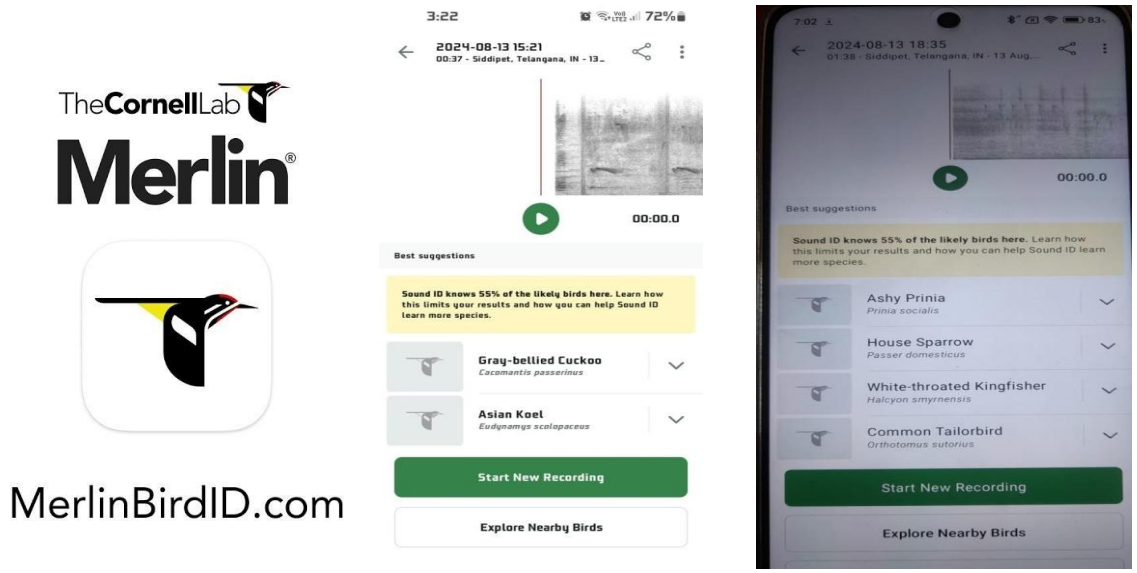
Fig. Komati cheruvu

PLACE 4: IDENTIFIED BIRDS AT NARSAPUR CHEUVU BY USING MERLIN APP:



BIRD NAME	SCIENTIFIC NAME	HABITAT	CHARACTERISTICS
1. Little cormorant	*Microcarbo niger*	Lowland freshwater bodies, including small pounds	Slightly smaller than the India cormorant it lacks a peaked head & short beak.
2. Red wattled lapwing	*Vanellus indicus*	Margins and dry beds of tank and puddles	Large waders, about 35 cm long, wings & back light brown.
3. Great Egret	*Ardea alba*	Marshes, ponds, shores, mudflats	Long legs, white plumage, and a slender body.
4. pigeon	*Columbidae*	Around barnyard, parks, and city building.	Pigeon are gentle, plump, small-billed birds with a skin saddle & forehead.
5. White browed bulbul	*Pycnonotus Luteolus*	Dry open scrub, gardens, woodland	White supercilium, white crescent below the eye, & dark eyes tripe.
6. Oriental magpie robin	*Copsychus saularis*	Open woodland & cultivated areas often close to human habitations	A medium- sized robin with a broad white wing bar running from the shoulder to the tip of the wing.
7. Grey heron	*Ardea cinerea*	Typically found in and around shallow water	Tall, with long legs, a long beak and black & white feathering.
8. Jacobin cuckoo	*Clamator jacobinus*	Thorny, dry scrub or open woodland	Slim black and white bird with a distinctive crest.

IDENTIFYING VARIOUS BIRDS BY USING MERLIN APP



RESULT & DISSCUSION

The structure and relative diversity of birds in different habitats is varied in the studied area. the relative abundance of species depends on the complexity of the habitat, availability of water and food. Diversity and density have important observation which determines the habitat quality. Loss of habitat is the major factor which affects diversity of resident and migratory birds. In Telangana region very, few reports are available on avian diversity. In the present report, efforts were made to study the avian diversity in Siddipet, Telangana state in various habitats like aquatic bodies, agricultural and scrub lands. In the studied area, a total 50 types of birds were identified which belongs to 28 family.

Birds are known to be responsive to any kind of change to their ambient conditions and can be used as bioindicator. Higher number of species diversity suggests the suitable environment for their population growth and availability of food resources of that region. Diversity is avian fauna is one of the most important ecological indicators to evaluate the quality of habitats.

The study site which is the region of siddipet, supports a wide range of biodiversity as it is located in Telangana. Total of 50 species have been sighted in siddipet district as per the merlin app. but there is No or very less documentation mentioning about the avian diversity in siddipet region,

Among the recorded avian diversity,1 species is found to be water bird, observed in Government degree college [A] in & around siddipet, Narsapur cheruvu, Erracheruvu. Erracheruvu & Komati cheruvu.

Erracheruvu is rich in water birds with dominance of spot billed duck, Asian koel, baya bird, purple sunbird, Indian peafowl. Komati cheruvu has species richness in laughing dove, greater coucal, little swift, common tailor bird. Majority of the birds were belonging Columbidae, Corvidae, Phasianidae, cistididae, & motacillidae

to families.

Aquatic birds like spot billed ducks are observed. The abundance of species is rich in wet land followed by open space and crop fields. Komati cheruvu is the open space present in Siddipet, surrounded by crop lands. It was observed that less human intervention favored more species richness and abundance as compared to the other wet lands. Erracheruvu also has similar habitat features but lacks in the surrounding cropland. Hence, comparatively less species richness was observed in Erracheruvu.

Komati cheruvu is a fresh water body with less richness in the bird's diversity. Shannon diversity and Simpson diversity of indices presented that crop land habitat has more diversity among the studied area followed by crop land, open space and wet lands. Species evenness is high in open spaces followed by wet land (Komati cheruvu and Erracheruvu) and crop land. It was observed that more habitat similarity was found between Erracheruvu - Komati cheruvu followed by crop land - open space. High species richness and abundance was found in crop land followed by open space and Government degree college [A] in & around siddipet. In the area present study, species heterogeneity and abundance status were more at crop land and open space ecosystems are present together which was observed at nearby Government degree college [A] in & around siddipet and Erracheruvu. In Telangana very, few reports are available on avian diversity. According to the report by our team members. A total no. of 50 types of bird species were noted at different croplands & open space of Siddipet district, Telangana. The present study emphasizes that vegetation structure and variables effect the avian diversity. High vegetation cover provides undisturbed habitat which intern supports rich avian diversity. The abundance of species is rich in wet land followed by open space and crop fields. Narsapurcheruvu is the largest water body present in Siddipet, surrounded by crop lands. It was observed that less human intervention favoured more species richness and abundance as compared to the other wet lands.

The three water bodies and nearby agriculture fields, significant vegetation structure in the region studied provides adequate food, water supply and good habitat, favors avian species richness and diversity. As Siddipet is one of the rapidly growing cities more conservational strategies should be implemented to protect avian diversity by scientific management of ecosystem.

The diversity in number of species is due to very suitable habitat for certain families like Cuculidea, phasinidea, Columbidae and slightly less suitable for all the least recorded families. Data shows us that in this, 40%of the species are residents which shows abundance of resources. The migratory species return almost 11%. Common species 48% & rare 1%.

Table 1: List of birds identified at Siddipet in and around area, Siddipet district:

COMMON NAME	SCIENTIFIC NAME	FAMILY	COMMON /RARE	TYPE OF DISTRIBUTION
1.Common tailorbird	*Orthotomus sutorius*	Cisticolidae	C	Resident
2.Ashy prinia	*Prinia Socialis*	Cisticolidae	C	Resident
3. Grey-bellied cuckoo	*Cacomantis passerinus*	Cuculidae	C	Resident
4. asain koel	*Eudynamys Scolopaceus*	Cuculidae	C	Resident
5. Greater coucal	*Centropus siinensis*	Cuculidae	C	Resident
6. Jacobin cuckoo	*Clamator jacobinus*	Cuculidae	C	Migratory
7. Common hawk cuckoo	*Hierococcyx varius*	Cuculidae	C	Resident
8. laughing dove	*Spilopelia senegalensis*	Columbidae	C	Resident
9. Spotted dove	*Streptopelia chinensis*	Columbidae	C	Resident
10. pigeon	*Columba livia*	Columbidae	C	Resident
11. Purple sunbird	*Cinnyris asiaticus*	Nectarinidae	C	Resident
12. Purple rumped sunbird	*Leptocoma zeylonica*	Nectarinidae	C	Resident
13. crow	*Corvus brachyrhyncho*	Corvidae	C	Migratory
14. Magpie	*Eurasian magpie*	Corvidae	R	Resident
15. Budgerigar	*Melopsittacus undulatus*	Psittaculidae	C	Resident
16. Parrot	*Psittaciformes*	Psittaculidae	C	Resident

17. Rosy faced love bird	*Agapornis roseicollis*	Psittaculidae	C	Resident
18.Indian pond heron	*Ardeola grayii*	Ardeidae	C	Resident
19. Grey heron	*Ardea cinerea*	Ardeidae	C	Resident
20. Great egret	*Ardea alba*	Ardeidae	C	Migratory
21. Little egret	*Egretta garzetta*	Ardeidae	R	Migratory
22.Red vented bulbul	*Pycnonotus cafer*	Pycnonotidae	C	Resident
23. White browed bulbul	*Pycnonotus luteolus*	Pycnonotidae	C	Resident
24. Common kingfisher	*Alcedo atthis*	Alcedinidae	C	Resident
25.White throated kingfisher	*Halcyon smyrnensis*	Alcedinidae	C	Resident
26. Baya bird	*Ploceus phillippinus*	Ploceidae	C	Resident
27. Small mini vet	*Pericrocotus cinnamomeus*	Campephagidae	C	Resident
28.House sparrow	*Passer domestics*	Passer domesticus	C	Migratory
29.Humming bird	*Trochilidae*	Trochilidae	C	Migratory
30. Common myna	*Acridotheres tristis*	Sturnidae	C	Resident
31. Large grey babbler	*Argya malcolmi*	Leiothrichidae	C	Resident
32. Yellow billed babbler	*Argya affinis*	Leiothrichidae	C	Resident
33. Pale billed flowerpecker	*Dicaem erthrorhynchos*	Dicaeidae	C	Resident

34.greensandpiper	*Tringa ochropus*	Scolopacidae	C	Resident
35. Cockkatiel	*Nymphicus hollandicus*	Cacatuidae	C	Resident
36. India robin	*Copsychus fulicatus*	Muscicapidae	C	Resident
37. Brown rack chat	*Oenanthe fusca*	Musciapidae	C	Resident
38. Purple moorhen	*Porphyrio poliocephalus*	Rallidae	C	Resident
39. Scaly breasted munia	*Lonchura punctulata*	Estrildidae	C	Resident
40. Roller	*Coracias benghalensis*	Coraciidae	C	Resident
41. Copper smith barbet	*Psilopogon haemacephalus*	Megalaimidae	C	Resident
42. Brown shrink	*Laniuscristatus*	Laniidae	C	Resident
43. White wag tail	*Motacilla alba*	Motacillidae	C	Resident
44. Brown rack chat	*Oenanthe fusca*	Musciapidae	C	Resident
45.Magpie	*Eurasian magpie*	Corvidae	R	Resident
46.Grey wag tail	*Motacilla cinerea*	Motacilillidae	C	Migratory
47.Red rumped swallow	*Cecropis daurica*	Hirundinidae	C	Resident
48.Black drongo	*Dicrurius macrocerucus*	Dicruridae	R	Resident
49.White naped woodpecker	*Chrysocolaptes festivus*	Picidae	C	Resident
50.Oriental white ibis	*Pseudibispapilo*	Threskorniothidae	C	Resident

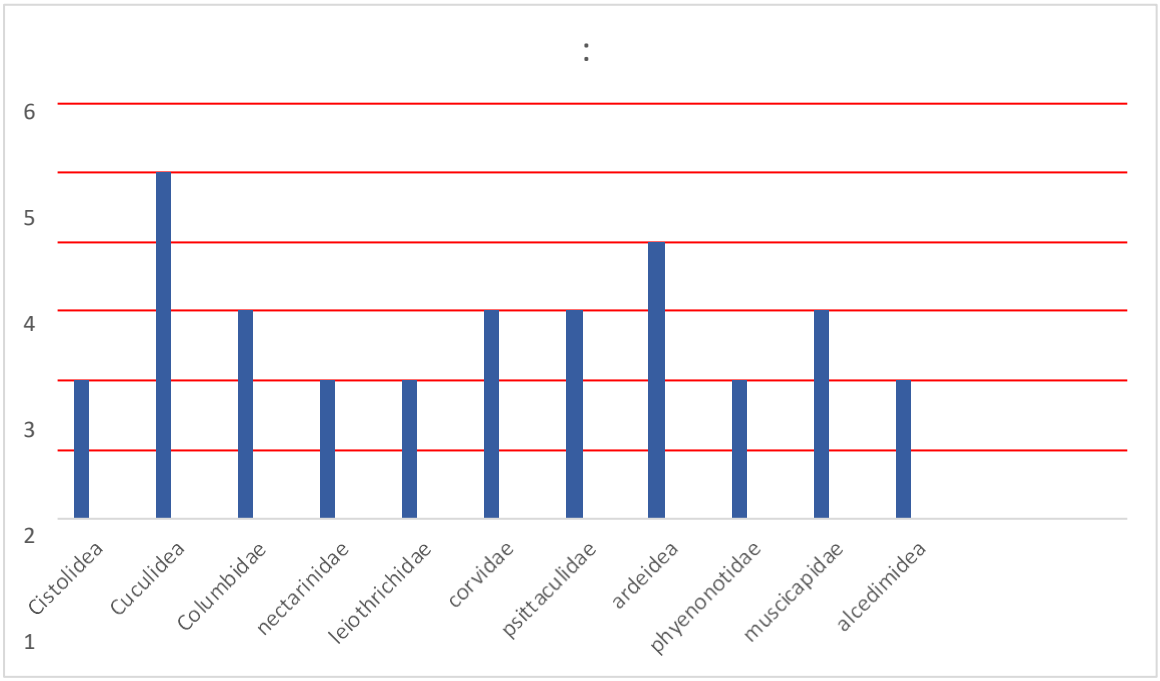
In the above table; mentioned that each species distribution and abundance of birds in Different places with

whether that are common or rare species with family & scientific name in visited areas are like Erra cheuvu, narsapur chervu, govet degree college(A), komati cheuvu. Total 50 types of birds were identified at cropland, wet land & open space by using Merlin bird app. In that 14 families are founded & 13 are repeatedly noted families. Repeatedly noted families are in species richness based on the habitat in avian diversity.

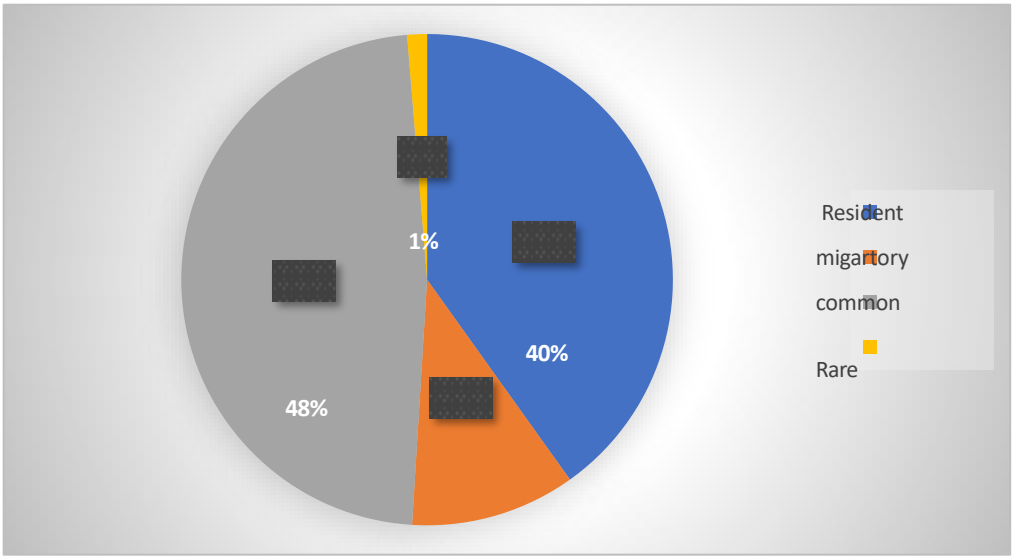
S.no	Ecosystem	Area	Abundant species	Richness
1.	wetland	Yerracheruvu	White throated kingfisher	++++
			Asain koel	+++
			Small mini vet	+++
			Spoted dove	++++
			Purple sunbird	+++
2.	Open space	Govt degree College(A) Siddipet	Red vented bulbul	++++
			House sparrow	++++
			Common myna	++++
			Crow	+++
			Common kingfisher	+++
3.	wetland	Komati cheruvu	Laughing dove	++++
			Great coucal	+++
			Indian pond heron	+++
			Rose ring paraket	++++
4.	wetland	Narsapur cheruvu	Little cormorant	+++
			Great Egret	+++
			Pigeon	++++
			Grey heron	+++
			White browed bulbul	+++

Table 2: Species richness and abundance of birds in the different areas of Siddipet.
Abundance (++++), Few (+++), Very few (++), Rare (+)

Distribution of families on number of species present:



Percentage occupied by types of species present:



CONCLUSION

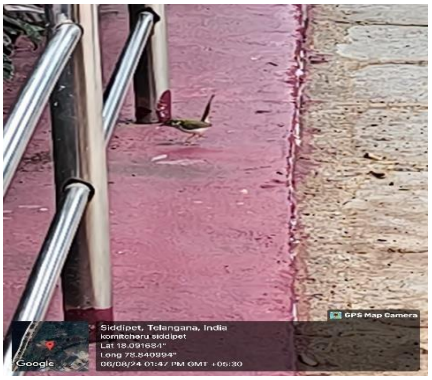
➢ In the present study, recorded avifaunal diversity indicted that siddipet area is a good habitat for both the aquatic & terrestrial birds, continuous monitoring assessment ecological factors and anthropogenic activities determines influence of various agents on avian diversity.

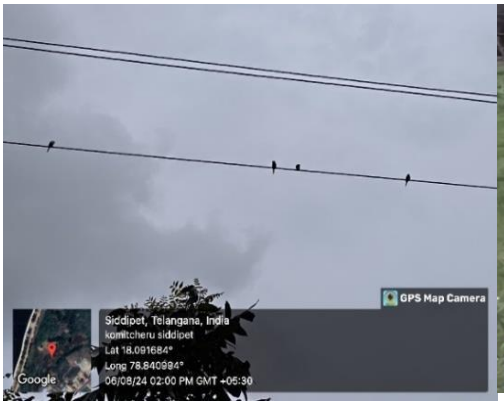
➢ We conclude that species spatial distributions are directly affected by global warming and subsequently climate change. evidence found specifically from birds show that there is a correlation between bird population characteristics and alterations in climate factors such as temperature and precipitation.

➢ We understand the bird community structure & niche relationships, in depth analysis of

avian population but it will be catalyzing factor for effective management of avian population.

- In terms of habitat quality, variation in vegetation appeared to be more important to determine the bird diversity & species richness.
- Analysis is truly a hot spot for further research to collaborate & authentic the existing research data.
- To effectively safeguard avifauna, a multipronged strategy needs to be devised at every level toss these ecologically sensitive bird diversity





REFERENCES

1. **P Pavani et al 2024** Assessing aquatic avifaunal diversity and its impact on invertebrate fish population in Komati Cheruvu, Siddipet, Telangana *International Journal of Applied Research* 2024; 10(9): 205-209

2. **Ali, S. 2002**. The Book of Indian Birds, Bombay Natural History Society, Oxford University, Press.

3. **Ali, S. 2012**. The Book of Indian Birds, Bombay Natural History Society, Oxford University, Press, 13th edition, 1-326.

4. **Aggarwal, A., Tiwari, G., Harsh, S. (2015).** Avian diversity and density estimation of birds of the Indian institute of forest management campus, Bhopal, India, *Journal of Threatened Taxa*, 7(2), 6891–6902. doi: https://doi.org/10.11609/JoTT.o3888.6891-902

5. **Issa. M.A.A. (2019).** Diversity and abundance of wild birds' species in two different habitats at Sharkia Governorate, Egypt. *Issa The Journal of Basic and Applied Zoology*, 80, 34. doi: 10.1186/s41936-019-0103-5

6. **Whelan, C. J., Wenny, D.G., Marquis, R. J. (2008).** Ecosystem services provided by birds. *Annals of New York Academy of Sciences*, 1134, 25-60. doi: 10.1196/annals.1439.003.

7. **Laxmi Narayana, B., Vasudeva Rao, V., Pandiyan, J. (2015).** Avifaunal diversity in different croplands of Nalgonda District, Telangana, Southern India, *International Journal of Current research*, 7 (7),17677-17682.

8. **BILGRAMI, KS**. 1995. Concept and conservation of biodiversity. CBS Publisher and distributors, Delhi.

9. **BARVE, S.**, & Warier, R. (2013). Birds diversity of the sharavathy landscape, Karnataka. India BIRDS.

10. **Rahman F.and Ismail, A**. 2018. Water birds. An important bio-indicator of ecosystem. Pertanika journal of scholarly research review.

11. **Ali S. AND Ripely S.D**. (19830 Handbook of the birds of India and Pakistan (Compact edition). Oxford university press, new Delhi.pp737.

12. **Blair R. (1996)** Land use and avian species diversity along urban gradient. Ecological application 6:506-519.

13. **Joshua j. and john Singh A.J.T. (1986)** observation on birds on mundathurai platen, Tamilnadu. Journal Bombay National History Sociaty,75:1028-1035

14. **Joshi K. K., Bhatt D. and Thapliyal A. (2012)** Avian diversity and its association with vegetation structure in different elevational zones of Naintial district. International Journal of Biodiversity and Conservation 4(11)364-376.

15. **Narsimha. A., V. Sudarshan. (2017).** Contamination of fluoride in groundwater and its effect on human health: a case study in hard rock aquifers of Siddipet, Telangana State, India. Applied Water Science, 7, 2501-2512. https://doi.org/10.1007/s13201-016-0441-0

16. **Grimmett, R., Inskipp, C., Inskipp, T. (2000).** *Pocket guide to the birds of the Indian subcontinent*. Oxford University press: UK.

17. **Rahayuninagsih, M., Mardiastuti, A., Prasetyo, L., Mulyani, Y. (2007).** Bird communit y in Burung Island, Karimunjawa national park, Central Java, *Biodiversitas*. 8, 183–187. doi: 10.13057/BIODIV/D080304

18. **F. Bibi and Z. Ali**. Measurement of diversity indices of avian communities at Taunsa

19. **Vikas Kumar**, "Biodiversity of avian fauna of vansda National park, Gujarat" Conservation Issues nature Environment and pollution Technology,14(3),709-71 4,2015.

20. **Prasad, K. K., Ramakrishna, B., Srinivasulu, C., Srinivasulu., B. (2014).** Avifa unal diversity of Manjeera Wildlife Sanctuary, Andhra Pradesh, India. *Journal of Threatened Taxa*, 6(2), 5464–5477. doi: https://doi.org/10.11609/JoTT.o3505.5464-77